1582 AD

there was a source of error in the estimate of the odd fraction of 0.25 day. rather than 0.2422 day; and by the 16th century, the accumulated error amounted to 10 days. In 1582, Pope Gregory $\overline{XIII}$ ordered the so-called Gregorian reform, omitting 10 days of that year (the day following Oct. 4 was Oct. 15) to bring calendar and

prescribing that the future intercalary day be omitted from all years divisible by 100 except those divisible by 400; thus, 1700, 1800, and 1900 were 365-day yrs, while 1600 was a leap year and 2000 will be a leap year. England and her colonies did not adopt the Gregorian calendar until 1752; Russia not until 1918. This calendar - now in general use, with error in the fourth decimal place will amount to a full day in about 3,300 years

1582

Pope Gregory XIII
ordered 10 days be dropped from Oct 1582
Oct. 5, 1582 was renamed Oct. 15
(i.e. There was no Oct. 5, 6, 7, 8, 9, 10,
11, 12, 13, or 14) thus losing 10 days)
This procedure restored the next
equinox to its proper date (actually
Mar. 21). He corrected the Julian
Cal by saying that the century
yrs divisible by 400 evenly

would be leap years whereas the others
would not be leap yrs.

Thus 1600 & 2000 was & will be leap
but 17,00, 1800, 1900 were not.
(In England, the Julian Cal
went right on. i.e. 1700 was a
leap year.) (In 1752, they corrected
their Cal. & moved new years
from mar 25 to Jan 1, that is,
they adopted the Gregorian Cal.
in Sept 1752) (my thoughts)

1582

The Gregorian Cal. was so accurate that the difference between the Cal. and solar years is now only 26 seconds.

This difference will increase by 0.53 sec every hundred years, because the solar year is gradually growing shorter.

The equinox of 1582 fell on Mar. 11. He cut 10 days out. The day after Thu, Oct. 4, 1582 became Fri Oct 15, 1582. (note the continuity of the days of the week was maintained). It was decreed that century yrs would not be leap yrs unless divided by 400 evenly.

the Gregorian year = an ave of 365.2425 days/yr and is therefore longer than

the civil solar year by 0.0003 day per yr.
The excess amounts to 3 days every 10,000 yrs
$$(10,000)(0.0003) = 3.0$$

The solar varies in length (altho very slowly)
The rotation of earth on its axis is subject
to variations, some of which cannot be
predicted

Accumulation of Surplus time
had displaced the vernal equinox
to March 11 from Mar 21, the
date set in 4th century. (Council of Nicaea)

Pope Gregory XIII suppressed 10 days
and ordained that century yrs had to be
divisible by 400 to be leap yrs.

Accepted in most Roman Catholic countries
immediately (over)

IN Eastern Church, the Julian Calendar was retained until the 20th century

By my calc from 100 to 1500 there was a gain of 11.7 days - 12 days

If Gregorian were in effect at year 1 AD

100 no leap	1300 no leap	(The Vernal Equinox was 3/21 in 4th Century. Previous to this it was later maybe even 3/25)
200 no leap	1400 no leap	
300 no leap	1500 no leap	
500 no leap		
600 no leap	12 days	
700 no leap		
900 no leap	Why didn't he suppress
1000 no leap	11 or 11.7 days	Set by J. Caesar
1100 no leap	Mar 21 to Noon 25 = 4 days

1582

The ~~Average~~ year length for Gregorian
Cal is
$$365d \ 5h \ 49m \ 12 \ sec$$

$$365.2425$$

$$31,556,952 \ sec.$$

1582

The Julian year of 365.25 days was longer than the solar year by 11 min. 14 sec. The error amounted to a day in 128 years, and in a few centuries the vernal equinox had fallen behind the Julian Cal. by several days.

In 1582, when Pope Gregory XIII, with the

aid of Aloysius Lilius undertook the reformation
of the Cal. there was an error of more than 10
days. Gregory suppressed 10 days. Oct. 5,
1582 became Oct 15, 1582.

    Also: Every yr divisible by 4 was a
    bissextile or leap year = 366 days.
    Every yr not divisible by 4 was 365d.
Every century yr divisible by 400 was 366d,
but if not — only 365 days. thus skipping
3 every 100 yrs.
    under this cal. the slight error amounts
to one day in 3866 years

1582

there was still a tiny error in Caesar's calendar. When almost 1600 years had passed, it began to be serious. In the year 1580, with the arrival of the spring equinox, one of the two days in the year when day and night are equal, Caesar's calendar said the date was MARCH 11 when it should have said MARCH 21. the Julian Calendar

was gaining a day every 128 years
{ (365.25 − 365.2422)(128) = 0.9984 days. }
and was out of step with the solar
year by ten whole days.

Pope Gregory XIII solved the problem.
three yrs in a row Feb. was given 28 days;
every fourth yr (leap yr) it got 29. Leap year is
ignored in the first year of a century whose
date cannot be evenly divided by 400
the average length of the year is 365.2425
In 1582 the day after Oct. 4 was Oct. 15. England
in 1752. Russia in 1918. Rumania & Greece 1924

1582

Pope Gregory adopted Jan. 1 as beginning of year.

Until then some nations began the year with Dec. 25 others with Jan 1. others with Mar. 25 (England)

France, Italy, Luxembourg
Portugal & Spain adopted
Gregorian Cal.

1582

Pope Gregory ordered
that the year beginning
that was Mar. 25
be changed to Jan. 1.

The retrospective correction feature has caused much confusion for many years since then Gregory XIII made the correction refer back to the NICENE Council Date. If he had not insisted on this point the alteration (3 or 4 century yes to the common) would have eliminated the confusion

If you omit leap ~~years~~ every 128 years the Cal would be rectified so that 100,000 years would elapse before it got out of step with the solar year by even 1 day.